Supplement of

Linear relationship between effective radius and precipitation water content near the top of convective clouds

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1 SM- Figures
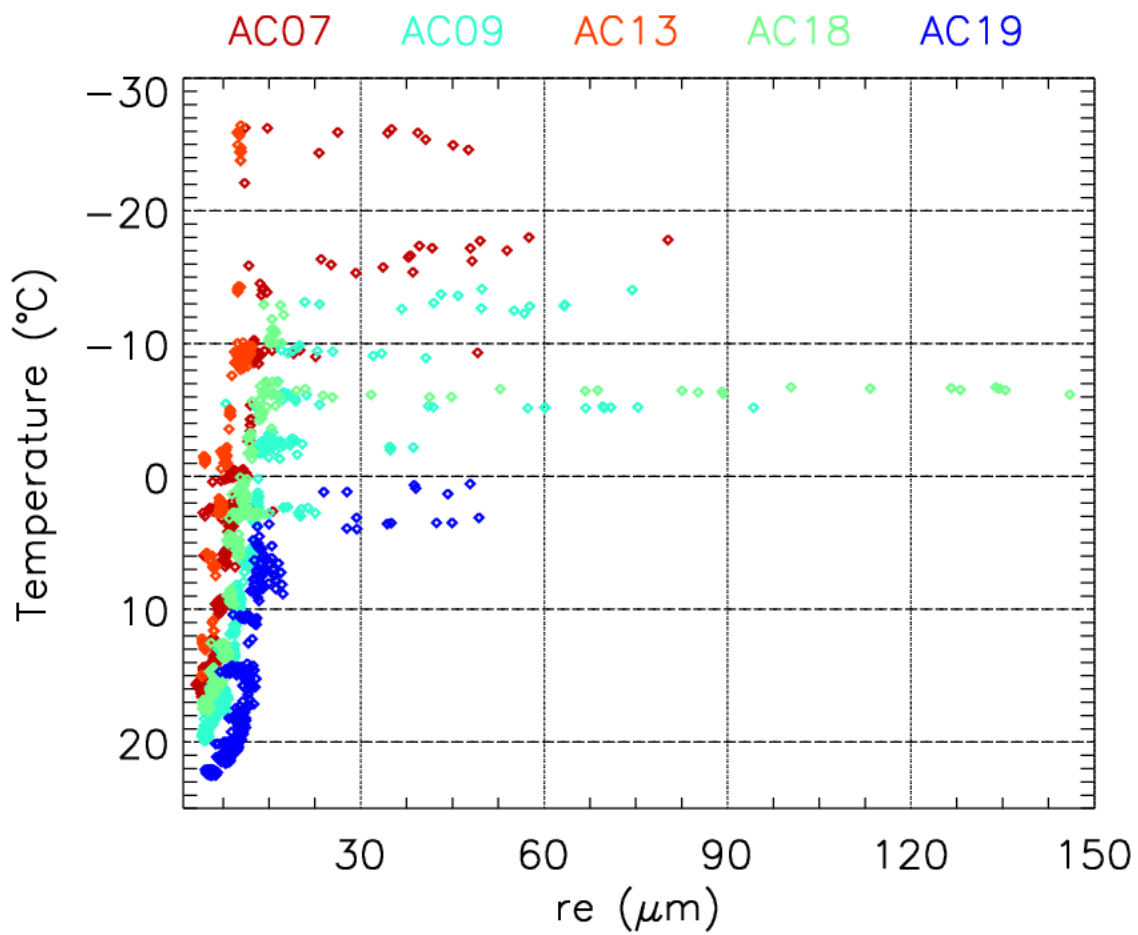
Figure S1. r_e vs. T measured within convective clouds during the cloud profiling flights. The flight numbers are indicated above the graph.
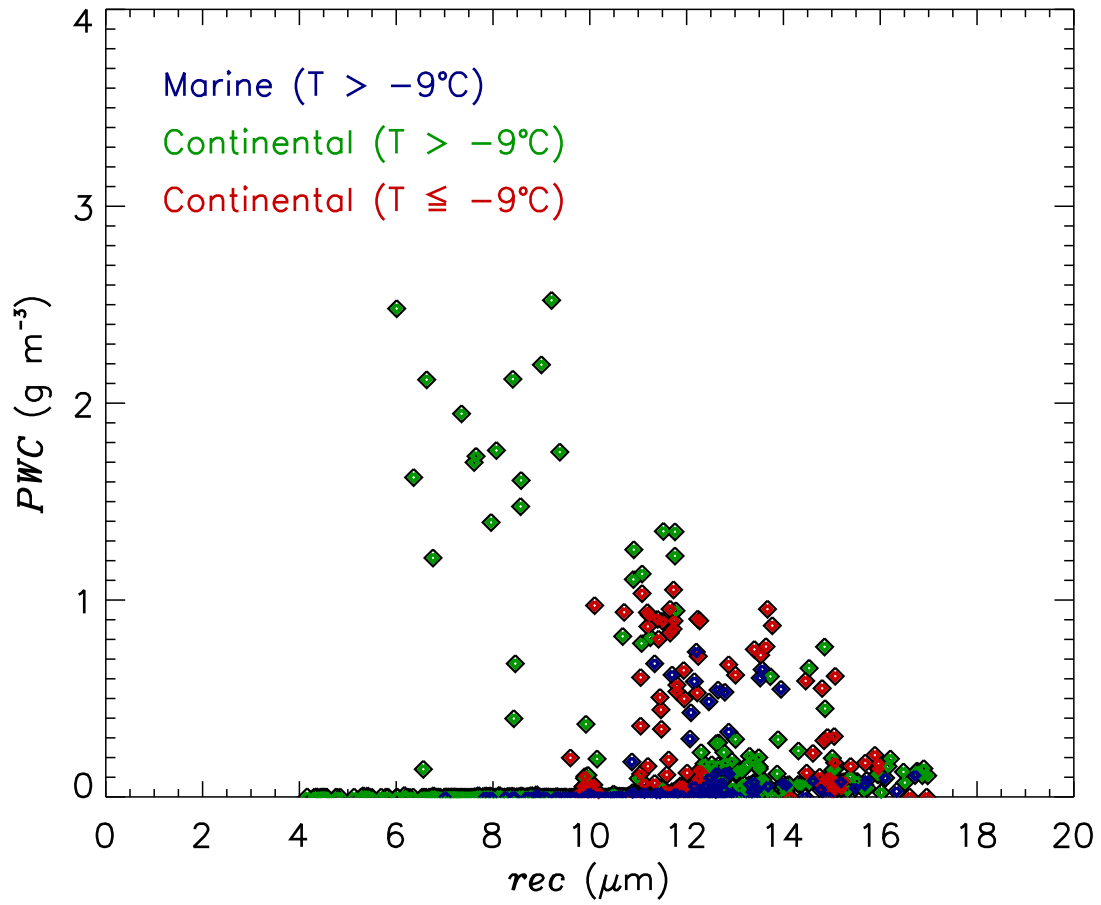
Figure S2. Cloud drop effective radius (r_{ec}) versus precipitation water content (*PWC*) measured within convective clouds over the Atlantic Ocean for temperatures (*T*) warmer than -9 ˚C (in blue), over the continent for T > -9 ˚C (in green) and T ≤ -9 ˚C (in red).
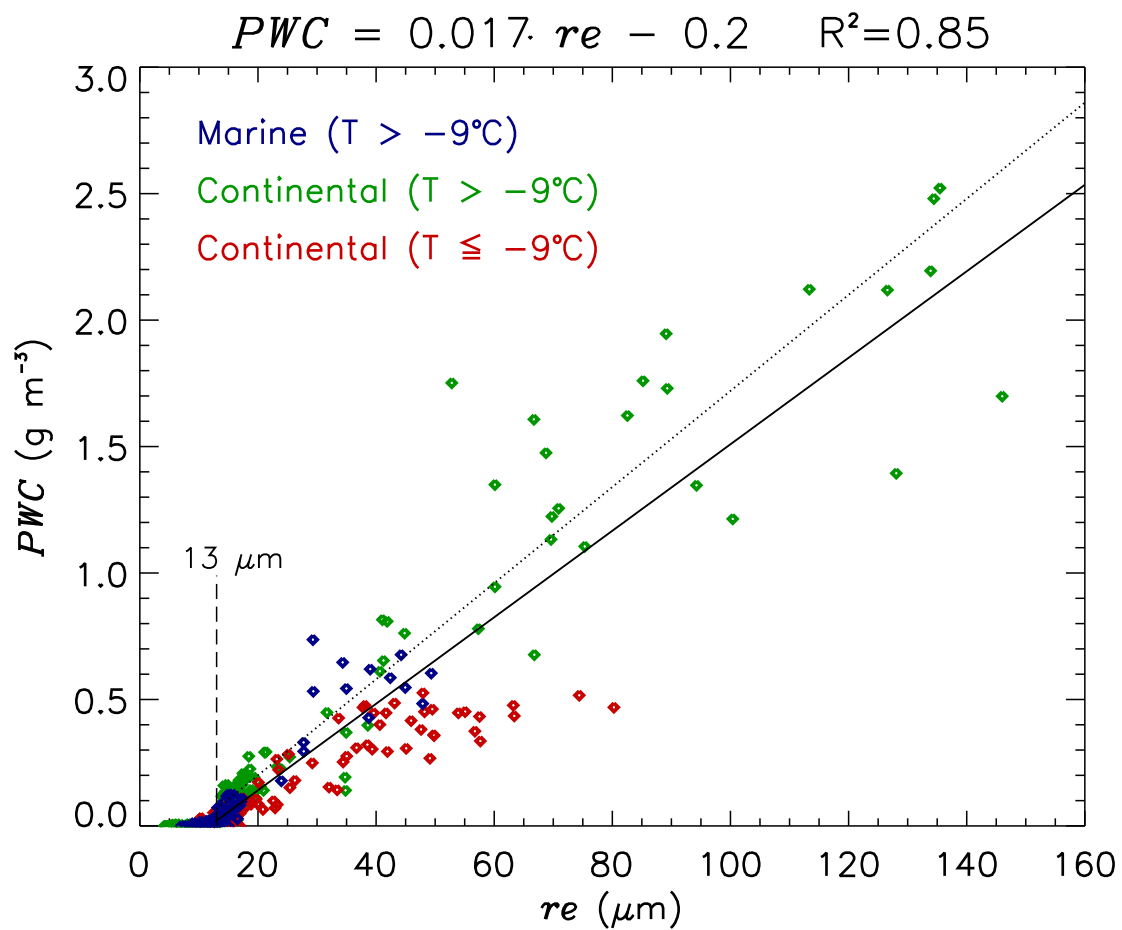
Figure S3. Similar to Fig. 2 for *PWC* calculated by assuming ice particles with a density of 0.45 g cm^{-3}.
The dotted line indicates the fit of *PWC* as a function of re shown in Fig. 2 (ice particles with a density of 0.9 g cm^{-3}).

930 μm
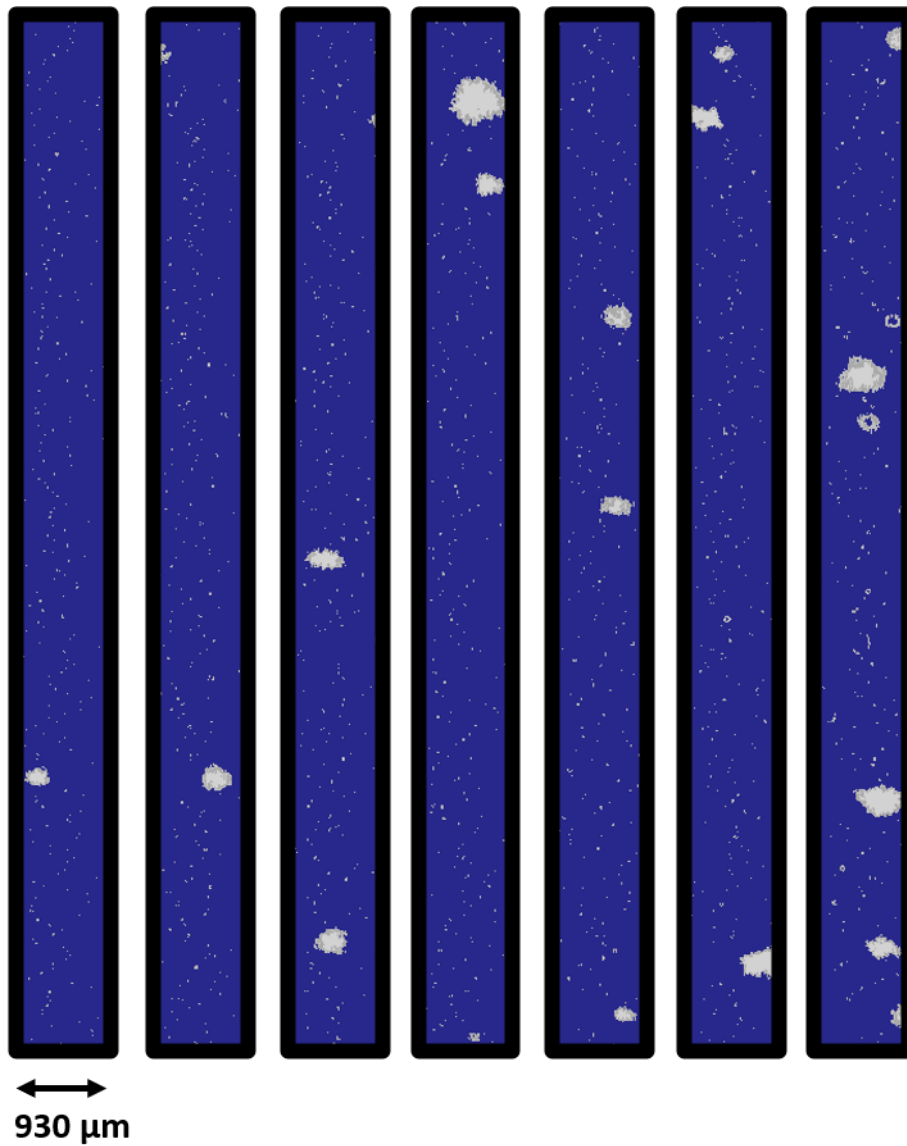
Figure S4. CCP–CIP images corresponding to cloud passes with ice and $r_e \sim 10$ μm. Data are from flight AC13 at cold temperatures ($\sim$ -25 ˚C).
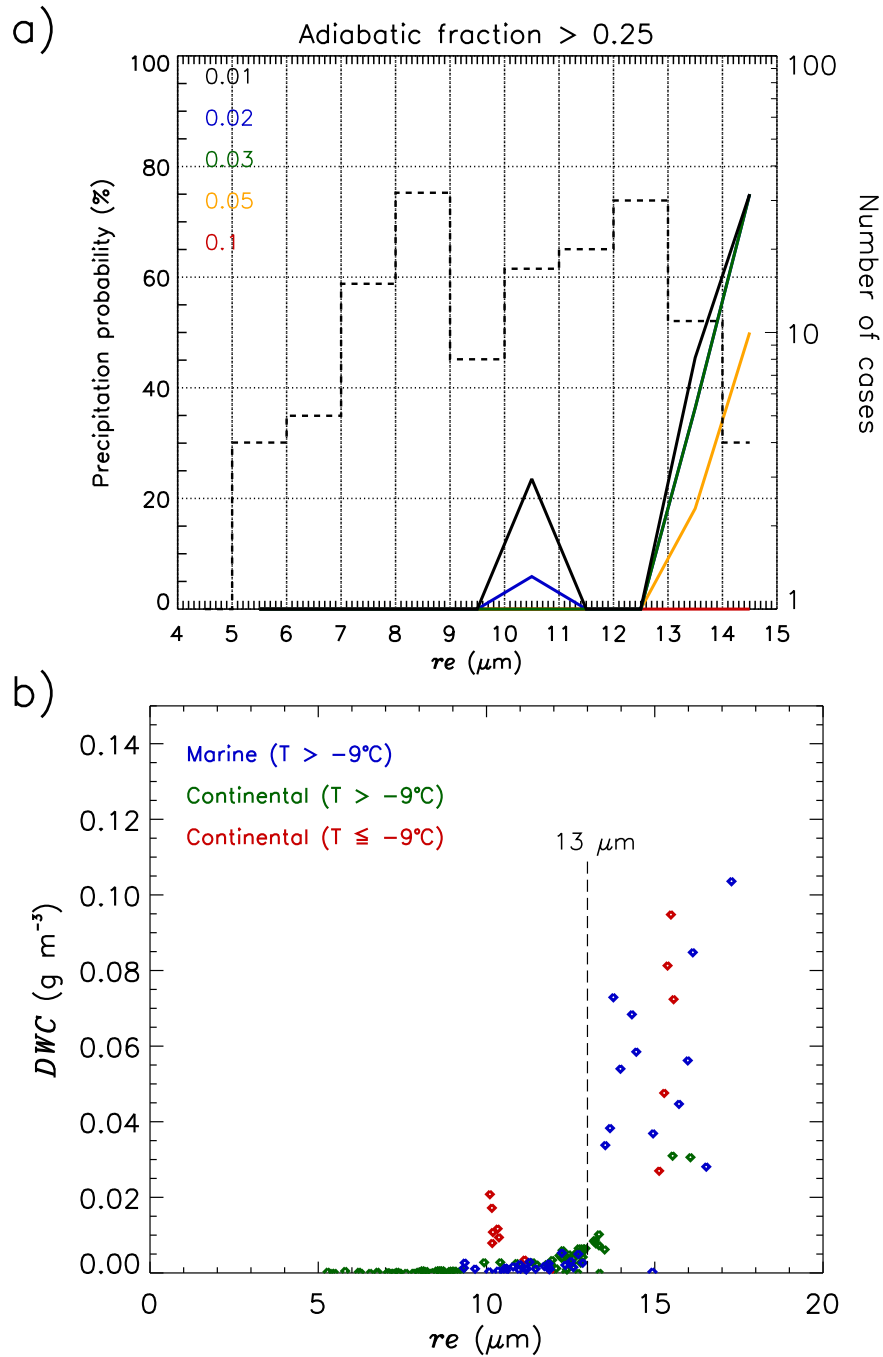
Figure S5. a) and b) Similar to Fig. 2 for 1 Hz in-cloud measurements with cloud water content larger than 25 % of the adiabatic water content.
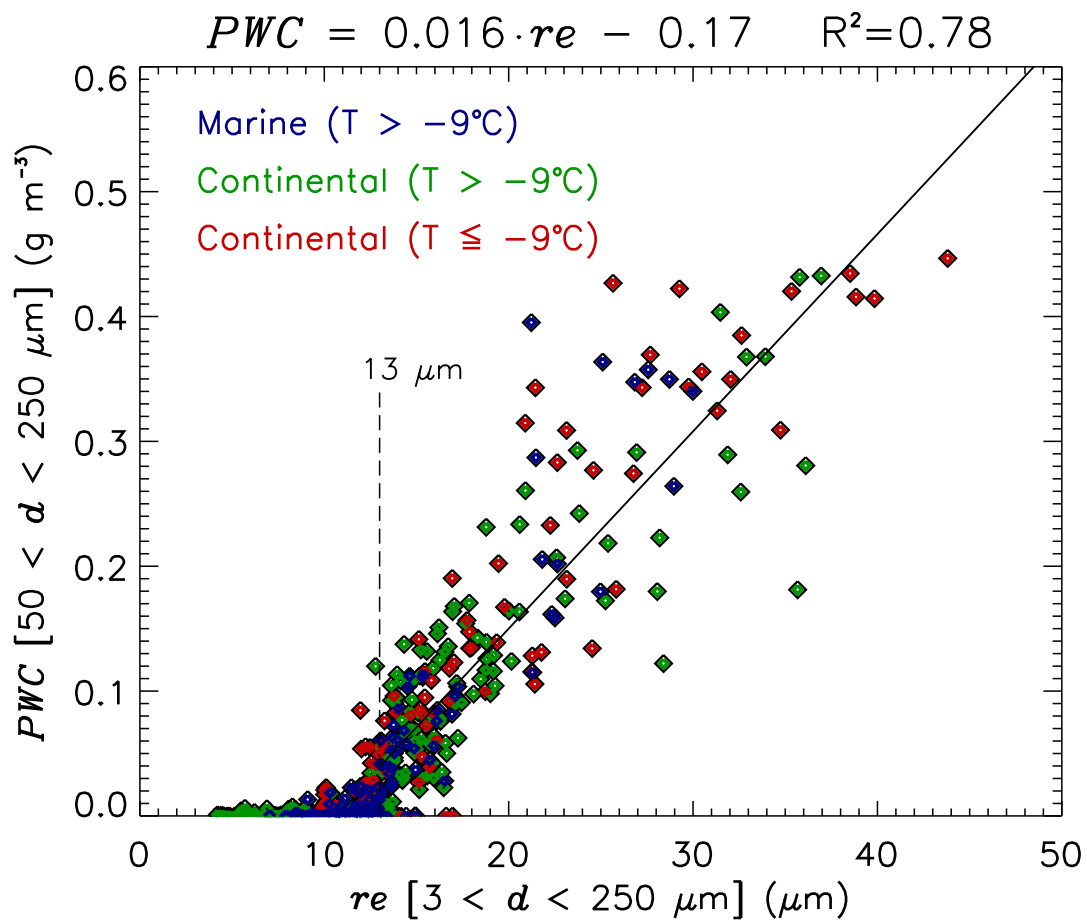
Figure S6. Similar to Fig. 2 for measurements of cloud particles with diameter size up to 250 μm. The size ranges of particle diameters used for calculating r_e and *PWC* are shown in the axis titles.
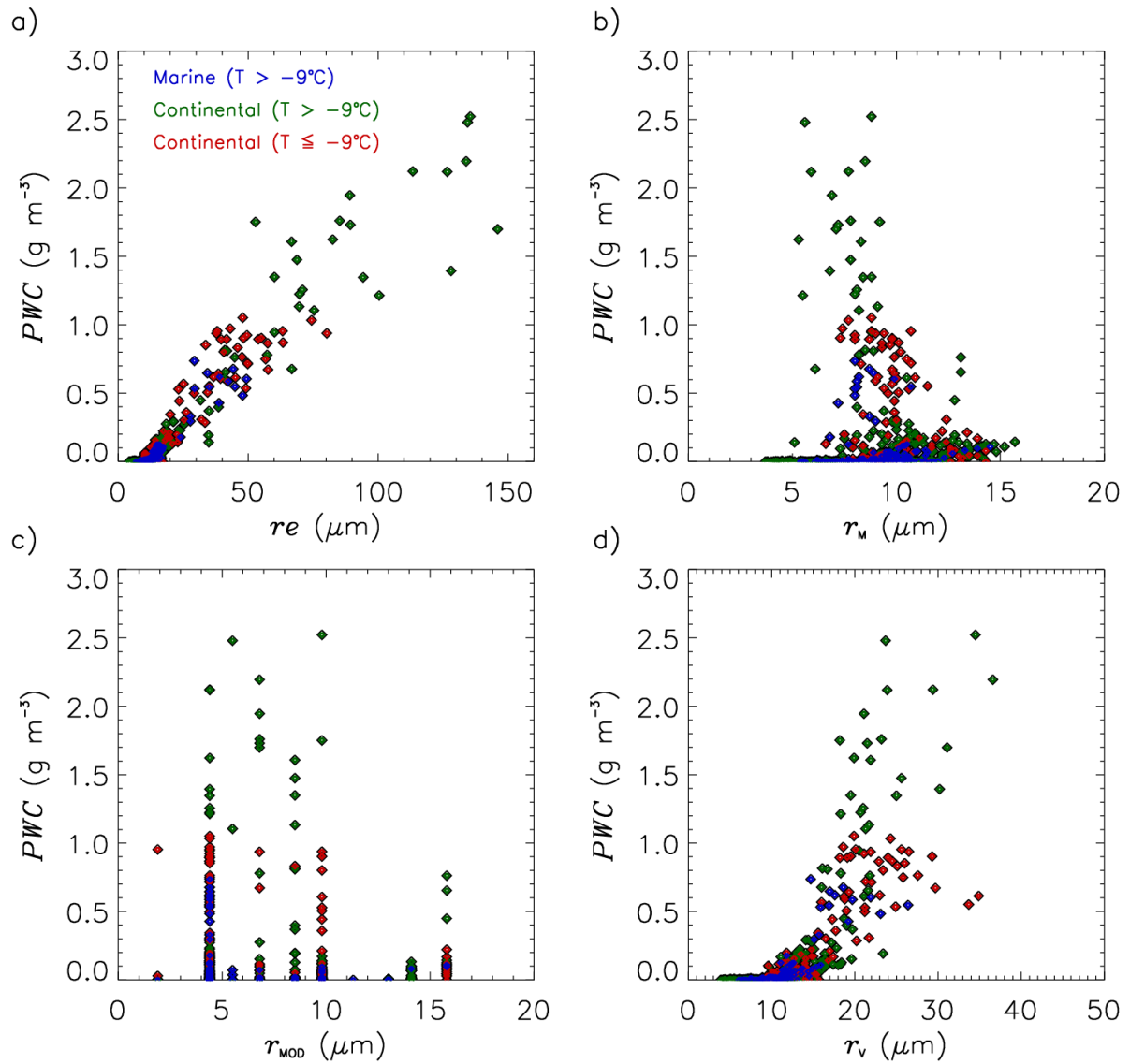
Figure S7. a) Effective radius of cloud particles (r_e) vs. precipitation water content (*PWC*) measured within convective clouds over the Atlantic Ocean for temperatures (*T*) warmer than -9 ˚C (blue), over the continent for T > -9 ˚C (green) and T ≤ -9 ˚C (red). Similar to a) for b) mean radius (r_M), c) modal radius (r_{MOD}) and d) mean volume radius (r_V). See the description of these parameters in Section 2.2.
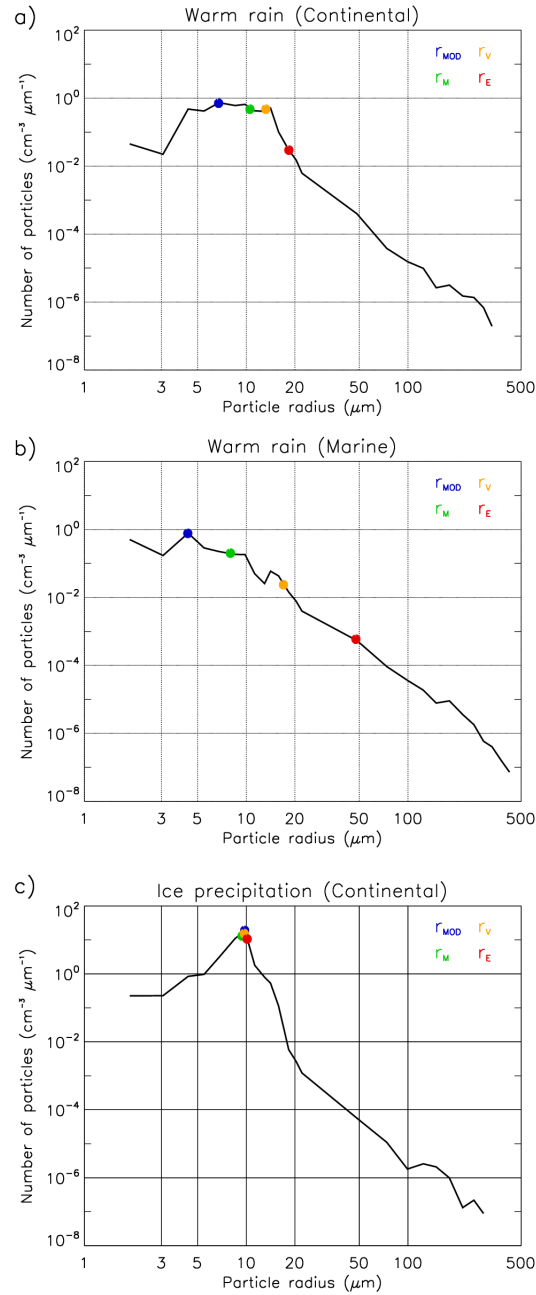
Figure S8. a) Number size distribution of particles in clean convective clouds measured with the CCP instrument during flight AC09 for a cloud pass with warm precipitation (or formed by coalescence processes). The values of modal radius (r_{MOD}), mean radius (r_M), mean volume radius (r_V) and effective radius (r_e) are indicated by colors (blue, green, orange and red, respectively). b) similar for a cloud pass in clean convective clouds measured over the Atlantic Ocean during flight AC19. c) similar for a cloud pass in polluted convective clouds measured over the deforestation arc during flight AC13. For this case precipitating particles were formed by accretion processes. The particle size distributions at a), b) and c) are the same as shown in Fig.4 by solid lines .